

# **WATER-PREVENTING GROMMET FOR PULL CHAIN SWITCH**

## **1. Field of the Invention**

The present invention relates to a grommet for a pull chain switch, and more particularly to a grommet that prevents water entering into the pull chain switch.

## **2. Description of Related Art**

Pull chain switch is commonly used on electric appliances, especially for ceiling fans, ceiling lights, or other electric appliances suspended at high places, to conveniently control an on/off operation, a brightness operation, or a speed-controlling operation etc.. With reference to Fig. 5, a pull chain switch (not shown) is attached to a switch housing 20 on a ceiling fan (not shown). The switch housing 20 has a connecting tube 22 with a passage 24 formed on an outer periphery of the switch housing 20. The pull chain switch is accommodated inside the switch housing 20 and has a bead-chain 26 extending out of the switch housing 20 via the passage 24 of the connecting tube 22. In order to smooth the operation of pull chain switch, a grommet 30 in accordance with the prior art is detachably mounted on the connecting tube 22 to extend a longitudinal distance of pulling the bead-chain 26.

The grommet 30 has an abutting end 32 with a recess (not numbered), a distal end (not numbered) with a flat edge 34 and a longitudinal hole 36. The abutting end 32 attaches to the switch housing 20 by receiving the connecting tube 22 inside the recess by means of wedging or screwing. When the grommet 30 mounted on the switch housing 20, the longitudinal hole 36 aligns to the passage 24 of the connecting tube 22 to further extend the longitudinal distance of the bead-chain 26.

However, the conventional grommet 30 has some drawbacks as follows:

1           1. Water easily enters the longitudinal hole 36 and then enters into the  
2           switch housing 20 along the bead-chain 26 so that the pull chain switch is easily  
3           damped with water to cause malfunction to the ceiling fan.

4           2. The operation of pulling the bead-chain 26 is not smooth because the  
5           longitudinal hole 36 causes a right angle at the flat edge 34 on the distal end of the  
6           grommet, wherein the bead-chain 26 is easily jammed with the right angle at  
7           intervals between two beads and is easily worn out by friction of rubbing against  
8           the right angle.

9           The present invention provides a modified grommet to mitigate or obviate  
10          the disadvantages of the conventional grommet for the pull chain switch.

## 11          **SUMMARY OF THE INVENTION**

12          The first objective of the present invention is to provide a water-preventing  
13          grommet for a pull chain switch, which efficiently keeps water out of the pull chain  
14          switch to avoid malfunction.

15          The second objective of the present invention is to provide a water-  
16          preventing grommet for a pull chain switch, which smoothes operations of the pull  
17          chain switch.

18          The foregoing has outlined some of the pertinent objects of the invention.  
19          These objects should be construed to be merely illustrative of some of the more  
20          prominent features and applications of the intended invention. Many other beneficial  
21          results can be attained by applying the disclosed invention in a different manner or  
22          modifying the invention within the scope of the disclosure. Accordingly, other  
23          objects and a fuller understanding of the invention and the detailed description of  
24          the preferred embodiment in addition to the scope of the invention defined by the

1 claims taken in conjunction with the accompanying drawings.

2 **BRIEF DESCRIPTION OF THE DRAWINGS**

3 Fig. 1 is an exploded perspective view of a water-preventing grommet for a  
4 pull chain switch in accordance with the present invention, wherein the grommet is  
5 operationally illustrated in combination with a ceiling fan;

6 Fig. 2 is an enlarged perspective view of the water-preventing grommet in  
7 Fig. 1;

8 Fig. 3 is a partially cross-sectional perspective view of the water-preventing  
9 grommet in Fig. 2;

10 Fig. 4 is an operationally cross-sectional side plane view of the water-  
11 preventing grommet in Fig. 1, wherein water is kept away from the pull chain switch;  
12 and

13 Fig. 5 is an operationally cross-sectional side plane view of a conventional  
14 grommet in accordance with the prior art, wherein water easily enters a switch  
15 housing to damp the pull chain switch.

16 **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

17 As shown in Figs 1 to 3, a water-preventing grommet for a pull chain switch  
18 in accordance with the present invention comprises a body 10 with an abutting end  
19 12 and an inclined distal end 14, a recess 12, a downward passage 142, an optional  
20 C-shaped flange 144, an optional O-ring 126, and multiple optional ribs 124.

21 Wherein, the grommet is adapted to be detachably mounted a connecting tube 22 on  
22 a switch housing 20 as described in the description of the related art.

23 The body 10 is a cylinder with two opposite ends, respectively the abutting  
24 end 12 and the inclined distal end 14. The recess 122 is defined in the abutting end

1 12 and adapted to receive the connecting tube 22 to combine the body 10 and the  
2 connecting tube 22 together. Engagement of the recess 122 and the connecting tube  
3 22 can be achieved by means of force interference. However, in a preferred  
4 embodiment as shown in Fig. 3, the recess 122 further has a threaded inner  
5 periphery and the connecting tube 22 has a threaded outer periphery (not numbered)  
6 so that the engagement can be achieved by means of screwing. Additionally, the  
7 abutting end 12 further has an outer periphery (not numbered) and multiple ribs 124  
8 longitudinally formed on the outer periphery so that a user can easily holds and  
9 rotates the grommet.

10 With further reference to Fig. 4, the inclined distal end 14 of the body 10 has  
11 a flat distal face (not numbered), an upper extending portion 141 and a lower  
12 guiding portion 143 opposite to the upper extending portion 141. The downward  
13 passage 142 is defined through the inclined distal end 14 to communicate to the  
14 recess 122 in the abutting end 12 and extends to the lower guiding portion 143 to  
15 define an opening (not numbered) on the flat distal face. Preferably, the inclined  
16 distal end 14 further has the C-shaped flange 144 formed on the flat distal face  
17 around the opening, wherein the C-shaped flange has its gap facing downward.

18 The O-ring 126 attaches to the abutting end 12 and is clamped between the  
19 body 10 and an outer periphery of the switch housing 20 when the grommet is  
20 mounted on the switch housing 20. Because the grommet has to be mounted on the  
21 connecting tube 22 at a correct location where the upper extending portion 141 must  
22 be the top over the lower guiding portion 143, therefore, the O-ring 126 provides a  
23 flexible capability to allow further rotating the body 10 until the grommet is at the  
24 correct location. Wherein, the downward passage 142 extends down when the

1 grommet is at the correct location.

2           With reference to Fig. 4 again, when the water-preventing grommet for a  
3 pull chain switch mounts on the switch housing 20, a bead-chain 26 extends out of  
4 the switch housing 20 and passes through the downward passage 142. As shown in  
5 Fig. 4, the opening of the downward passage 142 is shaded by the top extending  
6 portion 141 to keep rain drops away from the opening. Meanwhile, the C-shaped  
7 flange 144 also repels water even when rain drops fall on the inclined flat face of the  
8 inclined distal end. The downward passage 122 also provides a water-preventing  
9 efficiency to the pull chain switch because water can not resist the gravity to flow  
10 upward to enter the switch housing 20. Therefore, the grommet provides an  
11 excellent water-preventing efficiency to the pull chain switch inside the switch  
12 housing 20. Additionally, the downward passage 122 eliminates right angle that  
13 blocks the bead-chain 26 as described in the conventional grommet so that the bead-  
14 chain 26 enables to be operated smoothly.

15           The present invention includes that contained in the appended claims, as  
16 well as that of the foregoing description. Although this invention has been described  
17 in its preferred form with a certain degree of particularity, it is understood that the  
18 present invention of the preferred form has been made only by way of example and  
19 that numerous changes in the details of construction and the combination and  
20 arrangement of parts any be resorted to without departing from the spirit and scope  
21 of the invention.